**MAT 271E Probability and Statistics**

**HOMEWORK 3**

**1)** Define a problem where you test a hypothesis mean **µX =** (a value you choose) with the **alternate hypothesis µX ≠** (the same value you have chosen) at the level of significance (α**)** of **0.05**, for a sample size N=**11,** by also defining your own values for the standard deviation () and mean (**)** of the sample. Show whether the hypothesis is **accepted or rejected**.

*(Hint: Define and solve a two-sided hypothesis testing question using t(student) distribution. Check MAT271E\_PART 10.pdf.)*

**2)** Define the same problem where you test a hypothesis mean **µX =** (a value you choose) this time with the **alternate hypothesis µX <** (the same value you have chosen), for the same level of significance (α**)** of **0.05**, same sample size N=**11** and the same standard deviation () and mean (**)** of the sample. Show whether the hypothesis is **accepted or rejected**.

*(Hint: Define and solve a one-sided hypothesis testing question using t (student) distribution.)*

**3)** Define a problem where you test a hypothesis standard deviation **σX=** (a value you choose) with the **alternate hypothesis σX ≠** (the same value you have chosen) at the level of significance (α**)** of **0.10**, for a sample size N=**15,** by also defining your own values for the standard deviation () of the sample. Show whether the hypothesis is **accepted or rejected**.

*(Hint: Define and solve a two-sided hypothesis testing question using χ2 (chi-square) distribution.)*

**4)** Define the same problem where you test a hypothesis standard deviation **σX=**(a value you choose) this time with the **alternate hypothesis σX >** (the same value you have chosen), for the same level of significance (α**)** of **0.10**, same sample size N=**15**and the same standard deviation () of the sample. Show whether the hypothesis is **accepted or rejected**.

*(Hint: Define and solve a one-sided hypothesis testing question using χ2 (chi-square) distribution.)*